



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|-------------------------------|---------------------|------------------|
| 10/777,909 | 02/12/2004 | William Preston Alexander III | AUS920030825US1 | 6082 |

35525 7590 12/07/2007
IBM CORP (YA)
C/O YEE & ASSOCIATES PC
P.O. BOX 802333
DALLAS, TX 75380

| |
|----------|
| EXAMINER |
|----------|

RAMPURIA, SATISH

| | |
|----------|--------------|
| ART UNIT | PAPER NUMBER |
|----------|--------------|

2191

| | |
|-----------|---------------|
| MAIL DATE | DELIVERY MODE |
|-----------|---------------|

12/07/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/777,909

Applicant(s)

ALEXANDER ET AL.

Examiner

Satish S. Rampuria

Art Unit

2191

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 7/17/07, 2/12/04.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date: _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to the application filed on 2/12/2004.
2. Claims 1-24 are pending.

Information Disclosure Statement

3. An initialed and dated copy of Applicant's IDS form 1449 filed on 7/17/2007 and 2/12/2004 is attached to the instant Office action.

Oath/Declaration

4. The Office acknowledges receipt of a properly signed oath/declaration filed 2/12/2004.

Drawings

5. The drawings were received on 2/12/2004. These drawings are acceptable by the examiner.

Specification

6. The disclosure is objected to because of the following informalities:
Appropriate correction is required.
7. Applicant is required to update the status (pending, allowed, etc.) of all parent priority applications in the first line of the specification. The status of all citations of US filed applications in the specification should also be updated where appropriate.

Claim Rejections - 35 USC § 101

8. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

9. Claims 9-24 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 9-16 recite one computer program product in a computer readable medium, however, computer readable medium as described in the published specification [0178] that includes transmission-type media, such as digital and analog communications links, wired or wireless communications links using transmission forms such as for example, radio frequency and light wave transmission. Claims that recite nothing but the physical characteristics of a form of energy, such as a frequency, voltage, or the strength of a magnetic field, define energy or magnetism per se, and as such are nonstatutory natural phenomena. *O'Reilly v. Morse*, 56 U.S. (15 How.) 62, 112-14 (1853). Moreover, it does not appear that a claim reciting a signal encoded with functional descriptive material falls within any of the categories of patentable subject matter set forth in § 101.

Claims 17-24 are directed to apparatus of functional descriptive material per se, and hence non-statutory. There are no indications or suggestions in the published specification [0138] and [0154] or claims that would associate the recited software components in the claims with hardware elements (i.e., memory or processor) of the

electronic device. The recited components of the claims can reasonably be interpreted as computer program modules/software per se. Therefore, the claims constitute computer programs representing computer listings per se. Such descriptions or expressions of the programs are not physical "things." They are neither computer components nor statutory processes, as they are not "acts" being performed. Such claimed computer programs do not define any structural and functional interrelationships between the computer program and other claimed elements of a computer, which permit the computer program's functionality to be realized. In contrast, a claimed computer-readable storage device encoded with a computer program is a computer element, which defines structural and functional interrelationships between the computer program and the rest of the computer, that permits the computer program's functionality to be realized, and is thus statutory. See Lowry, 32 F.3d at 1583-84, 32 USPQ2d at 1035.

Claim Rejections - 35 USC § 103

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 1, 4-8, 9, 12-16, 17, 20-24 rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 6,338,159 to Alexander III et al. (hereinafter,

Art Unit: 2191

Alexander(1)) in view of document (Title: JaViz: A client/server Java profiling tool) published on 2000 by Kazi et al. (hereinafter, Kazi).

Alexander(1) discloses:

1. A method, in a data processing system, for generating a minimized call tree data structure from trace data obtained from a plurality of executions of a computer program, comprising:

obtaining a plurality of call tree data structures (col. 2, lines 32-33 "a call stack...one or more nodes in the tree") corresponding to the trace data (col. 2, lines 28-29 "trace information...obtained...") for the plurality of executions of the computer program (col. 2, lines, 38-39 "...number of Java bytecodes executed in each method... called").

Alexander(1) does not disclose generating a minimized call tree data structure from the plurality of call tree data structures wherein the minimized call tree data structure includes a minimum set of nodes that are consistent between the plurality of call tree data structures; and outputting the minimized call tree data structure.

However Kazi discloses in an analogous computer system generating a minimized call tree data structure from the plurality of call tree data structures (Kazi page 100 "Tree generation... merged trace files to create an output file containing the dynamic execution tree") wherein the minimized call tree data structure includes a minimum set of nodes that are consistent between the plurality of call tree data structures (Kazi page 100 "Tree generation... Run-time statistics generation... Each detailed... trace file is analyzed to gather the total number of calls made to each

Art Unit: 2191

method, the maximum, minimum, and average execution times, and the standard deviation of the execution time for each method"). Thereby minimizing the display for execution.; and outputting the minimized call tree data structure (Kazi page 100 "Tree generation... merged trace files to create an output file containing the dynamic execution tree").

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the method of generating a minimized call tree data structure from the plurality of call tree data structures wherein the minimized call tree data structure includes a minimum set of nodes that are consistent between the plurality of call tree data structures; and outputting the minimized call tree data structure as taught by Kazi into the method for providing the trace information as taught by Alexander(1). The modification would be obvious because of one of ordinary skill in the art would be motivated to generate a minimize call tree data structure from the trace data to provide a performance analysis tool to allow developer to determine the execution times have high of low variance as suggested by Kazi (page 115, "Conclusion").

Per claim 4:

The rejection of claim 1 is incorporated and further, Alexander discloses:

4. The method of claim 1, wherein generating the minimized call tree data structure includes: copying a first call tree data structure; and walking a second call tree data structure over the first call tree data structure to generate the minimized call tree data

Art Unit: 2191

structure (col. 6, lines 27-29 "the tree is traversed (i.e., walking) to the parent (using the parent pointer), and the current tree node is set equal to the parent node (step 178)... the tree can be dynamically pruned in order to reduce the amount of memory dedicated to its maintenance (step 179).").

Per claim 5:

The rejection of claim 4 is incorporated and further, Alexander discloses:

5. The method of claim 4, wherein walking the second call tree data structure over the first call tree data structure includes: for each node that exists in both the first call tree data structure and the second call tree data structure, generating a node in the minimized call tree data structure (col. 6, lines 33-35 "a check is made to determine if the module is already a child node of the current tree node (step 180). If not, a new node is created for the module and it is attached to the tree below the current tree node (step 182).") and associating values with the node (col. 7, lines 51-55 "Calls 190 lists.. number of times each routine has been called. Base 192 is the total time spent in the routine. Cum 194 is the cumulative time spent in the routine and all routines called by the routine. Cum2196 is the cumulative time plus time spent in recursive routines" and FIG. 9A where the base cum and sum values are disclosed).

Per claim 6:

The rejection of claim 5 is incorporated and further, Alexander discloses:

6. The method of claim 5, wherein the values associated with the node are values that correspond to the minimum of the values associated with corresponding nodes in the

Art Unit: 2191

first call tree data structure and the second call tree data structure (col. 7, lines 51-55

"Calls 190 lists.. number of times each routine has been called. Base 192 is the total time spent in the routine. Cum 194 is the cumulative time spent in the routine and all routines called by the routine. Cum2196 is the cumulative time plus time spent in recursive routines" and FIG. 9A where the base cum and sum values are disclosed).

Per claim 7:

The rejection of claim 4 is incorporated and further, Alexander discloses:

7. The method of claim 4, wherein walking the second call tree data structure over the first call tree data structure includes: for each node that exists in only one of the first call tree data structure and the second call tree data structure, inhibiting creating a node in the minimum call tree data structures (col. 6, lines 33-35 "a check is made to determine if the module is already a child node of the current tree node (step 180). If not, a new node is created for the module and it is attached to the tree below the current tree node (step 182).").

Per claim 8:

The rejection of claim 6 is incorporated and further, Alexander discloses:

8. The method of claim 6, wherein the values associated with each node in the minimized call tree data structure include a minimum base value, a minimum number of calls, a minimum cumulative value, and a minimum absolute cumulative value (col. 4, lines 43-48 "statistics shown include the number of distinct times the call stack is produced, the sum of the time spent in the call stack, the total time spent in the call stack plus the time in those

Art Unit: 2191

call stacks invoked from this call stack (referred to as cumulative time), and the number of instances of this routine above this instance (indicating depth of recursion”).

Claims 9, 12-16 are the computer readable medium claim corresponding to method claims 1, 4-8 respectively, and rejected under the same rationale set forth in connection with the rejection of claims 1, 4-8 respectively, above, as noted above.

Claims 17, 20-24 are the apparatus claim corresponding to method claims 1, 4-8 respectively, and rejected under the same rationale set forth in connection with the rejection of claims 1, 4-8 respectively, above, as noted above.

15. Claims 2, 3, 10, 11, 18, 19 rejected under 35 U.S.C. 103(a) as being unpatentable over Alexander(1) in view of Kazi and further in view of document (Title: unifying approach to performance analysis in the Java environment) published in 2000 by Alexander(2) (hereinafter, Alexander(2)).

Per claim 2:

The rejection of claim 1 is incorporated and further, neither Alexander(1) nor Kazi discloses inputting the trace data to an arcflow tool, wherein the arcflow tool generates the plurality of call tree data structures based on the trace data.

However, Alexander(2) discloses in an analogous computer system inputting the trace data to an arcflow tool (FIG. 2 and Table 3 and page 125 “Building arcflow model”

Art Unit: 2191

and page 127 "...arcflow model...constructed... are typically with... event trace collection") , wherein the arcflow tool generates the plurality of call tree data structures based on the trace data (FIG. 2 and Table 3 and page 125 "Building arcflow model" and page 127 "...arcflow model... constructed... are typically with... event trace collection... call tree...").

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the method of inputting the trace data to an arcflow tool, wherein the arcflow tool generates the plurality of call tree data structures based on the trace data as taught by Alexander(2) into the method of profiling tool using trace information as taught by the combination system of Alexander(1) and Kazi. The modification would be obvious because of one of ordinary skill in the art would be motivated to arcflow tool to allow user to view callstack trees graphically and cross reference the various x-files to enhance the value of arcflow as suggested by Alexander(2) (page 131 "Future work").

Per claim 3:

The rejection of claim 1 is incorporated and further, neither Alexander(1) nor Kazi discloses wherein the plurality of call tree data structures are xtree data structures.

However, Alexander(2) discloses in an analogous computer system wherein the plurality of call tree data structures are xtree data structures (Fig. 5 and page 125 "xtree report produced...call tree...").

Art Unit: 2191

The feature of the plurality of call tree data structures are xtree data structures would be obvious for the reasons set forth in the rejection of claim 2.

Claims 10, 11 are the computer readable medium claim corresponding to method claims 2, 3 respectively, and rejected under the same rationale set forth in connection with the rejection of claims 2, 3 respectively, above, as noted above.

Claims 18, 19 are the apparatus claim corresponding to method claims 2, 3 respectively, and rejected under the same rationale set forth in connection with the rejection of claims 2, 3 respectively, above, as noted above.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Satish S. Rampuria** whose telephone number is **(571) 272-3732**. The examiner can normally be reached on **8:30 am to 5:00 pm** Monday to Friday except every other Friday and Wednesday and federal holidays. Any inquiry of a general nature or relating to the status of this application should be directed to the **TC 2100 Group receptionist: 571-272-2100**.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Wei Y. Zhen** can be reached on **(571) 272-3708**. The fax

Art Unit: 2191

phone number for the organization where this application or proceeding is assigned is **571-273-8300**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Satish S. Rampuria
Patent Examiner/Software Engineer
Art Unit 2191



WEI ZHEN
SUPERVISORY PATENT EXAMINER